

WE CLAIM:

1 1. A method of connection establishment in a short-range wireless communication
2 environment, comprising:

3 a) generating a RF-ID interrogation signal by a first terminal equipped with a RF-ID
4 tag reader device;

5 b) detecting the RF-ID interrogation signal by a second terminal equipped with
6 means to detect and respond to RF-ID interrogation signals when within the range of the RF-ID
7 interrogation signal;

8 c) notifying a processor in the second terminal of the presence of the RF-ID
9 interrogation signal for setting a short-range communication module in the second terminal into a
10 predefined operation mode for being capable of detecting paging signals directed to the second
11 terminal;

12 d) responding to the RF-ID interrogation signal by transmitting a RF-ID response
13 signal to the first terminal including identification information relating to the short-range
14 communication module of the second terminal;

15 e) processing the received RF-ID response signal by the first terminal to activate a
16 short-range communication module in the first terminal to initiate a shortened session setup by
17 transmitting a short-range paging signal directed to the second terminal based on information of
18 the received RF-ID response signal to establish a short-range connection with the second
19 terminal; and

20 f) detecting the paging signal by the short-range communication module in the
21 second terminal for immediate establishment of a short-range connection between the first and
22 second terminals.

1 2. The method of Claim 1 further comprising:

2 g) incorporating in the second mobile terminal a RF-ID tag reader having tag
3 functionality and terminal identification information.

1 3. The method of Claim 2 further comprising:

2 h) switching the RF-ID tag reader in the second terminal to operate in a show
3 communication mode and simulate a RF-ID tag device.

1 4. The method of Claim 1 wherein the first and second terminals include RF-ID tag
2 readers operating in an active mode.

1 5. The method of Claim 1 wherein the RF-ID tag reader of the second terminal
2 operates in a powered down state and passive mode.

1 6. The method of Claim 4 wherein one RF-ID tag reader automatically switches to a
2 passive state when de-energized.

1 7. The method of Claim 1 wherein the short-range communication modules of the
2 first and the second terminals conform to the principles of Bluetooth technology.

1 8. The method of Claim 7 wherein the processor of the second terminal responding
2 terminal to the second terminal informs the Bluetooth module of the second terminal to enter into
3 a Bluetooth page scan mode after detecting an interrogation signal and responding to it with
4 identification information of the Bluetooth communication module in order to provide a
5 shortened device discovery and session setup between the terminals.

1 9. The method of Claim 7 wherein transmitting the paging signal by the first
2 terminal comprises transmitting by the first terminal a Bluetooth paging message to the second
3 terminal including the Bluetooth identification information of the short-range communication
4 module of the second terminal.

1 10. The method of claim 7, wherein the predefined operation mode of the second
2 terminal is Bluetooth Page scanning mode.

1 11. The method of Claim 7, wherein the identification information relating to the
2 short-range communication module of the second terminal includes at least a unique Bluetooth
3 identification number of the short-range communication module of the second terminal.

1 12. The method of Claim 1, further comprising:

2 i) periodically updating at least portion of the identification information relating to
3 the second terminal.

1 13. The method of Claim 12, wherein the identification information relating to the
2 short-range communication module of the second terminal includes a Bluetooth serial number
3 and Bluetooth Clock Offset information of the short-range communication module of the second
4 terminal.

1 14. The method of Claim 1, wherein one of the terminals is a stationary access point
2 connected to an infrastructure network enabling the other terminal to conduct transactions with
3 service applications within the communication network through the established wireless short
4 range connection.

1 15. The method of Claim 14, wherein the infrastructure network is the Internet.

1 16. The method of Claim 1, wherein the first and the second terminals are mobile
2 terminals.

1 17. The method of Claim 16 further comprising:

2 j) determining whether a short-range connection is acceptable.

1 18. The method of Claim 17 further comprising:

2 k) instructing the short-range communication module to enter into a page scanning
3 mode if the Bluetooth mode is acceptable.

1 19. Method of Claim 17 further comprising:

2 l) instructing the short-range communication module to enter into a non-
3 connectable connection if the Bluetooth mode is not acceptable.

20. Apparatus for connection establishment in a short-range wireless communication environment, comprising:

a) means for generating a RF-ID interrogation signal by a first terminal equipped with a RF-ID tag reader device;

b) means for detecting the RF-ID interrogation signal by a second terminal equipped with means to detect and respond to RF-ID interrogation signals when within the range of the RF-ID interrogation signal;

c) means for notifying a processor in the second terminal of the presence of the RF-ID interrogation signal for setting a short-range communication module in the second terminal into a predefined operation mode for being capable of detecting paging signals directed to the second terminal;

d) means in the second terminal for responding to the RF-ID interrogation signal by transmitting a RF-ID response signal to the first terminal including identification information relating to the short-range communication module of the second terminal;

e) means in the first terminal processing the RF-ID response signal to activate a short-range transceiver in the first transceiver to initiate a shortened session setup by transmitting a short-range paging signal to the second terminal based on information of the received RF-ID response signal to establish a short-range connection with the second terminal;
and

20 f) means in the second terminal for detecting the paging signal by the short-range
21 communication module for immediate establishment of a short-range connection between the
22 first and second terminals.

1 21. The Apparatus of Claim 20 wherein the second mobile terminal is a RF-ID tag
2 reader having tag functionality and terminal identification information

1 22. The Apparatus of Claim 20 further comprising:

2 g) means for switching the RF-ID tag reader in the second terminal to operate in a
3 show communication mode and simulate a RF-ID tag device.

1 23. The Apparatus of Claim 20 wherein the first and second terminals include RF-ID
2 tag readers operating in an active mode.

1 24. The Apparatus of Claim 20 wherein the RF-Tag reader of the second terminal
2 operates in a powered down state and passive mode.

1 25. The Apparatus of Claim 24 wherein one RF-Tag reader automatically switches to
2 passive state when de-energized.

1 26. The Apparatus of Claim 20 wherein the short-range communication modules of
2 the first and second terminals conform to the principles of Bluetooth technology.

1 27. The Apparatus of Claim 26 wherein the processor of the first terminal responding
2 terminal to the second terminal informs the Bluetooth module of the first terminal to enter into a
3 Bluetooth page scan mode after detecting an interrogation signal and responding to it with a
4 Bluetooth communication module identification information in order to provide a shortened
5 device discovery and session setup between the terminals.

1 28. The Apparatus of Claim 26 wherein transmitting the paging signal by the first
2 terminal comprises transmitting by the first terminal a Bluetooth paging message to the second
3 terminal including the Bluetooth identification information of the short-range communication
4 module of the second terminal.

1 29. The Apparatus of claim 26, wherein the predefined operation mode of the second
2 terminal is Bluetooth Page scanning mode.

1 30. The Apparatus of Claim 26, wherein the identification information relating to the
2 short-range communication module of the second terminal includes at least a unique Bluetooth
3 identification number of the short-range communication module of the second terminal.

1 31. The Apparatus of Claim 20, further comprising:

2 h) means periodically updating at least portion of the identification information
3 relating to the second terminal.

1 32. The Apparatus of Claim 31, wherein the identification information relating to the
2 short-range communication module of the second terminal includes a Bluetooth serial number
3 and Bluetooth Clock Offset information of the short-range communication module of the second
4 terminal.

1 33. The Apparatus of Claim 20, wherein one of the terminals is a stationary access
2 point connected to an infrastructure network enabling the other terminal to conduct transactions
3 with service applications within the communication network through the established wireless
4 short range connection.

1 34. The Apparatus of Claim 33 wherein the infrastructure network is the Internet.

1 35. The Apparatus of Claim 20, wherein the first and the second terminals are mobile
2 terminals.

1 36. The Apparatus of Claim 20 further comprising:

2 i) determining means determining whether a short-range connection is acceptable.

1 37. The Apparatus of Claim 36 further comprising:

2 j) instructing means instructing the short-range communication module to enter into
3 a page scanning mode if the Bluetooth mode is acceptable.

1 38. The apparatus of Claim 37 wherein the instructing means instructs the short-range
2 communication module to enter into a non-connectable connection if the Bluetooth mode is not
3 acceptable

1 39. The Apparatus of Claim 20 wherein the RF-ID tag reader comprises:
2 k) a radio frequency interface and an antenna; and
3 l) an associated logic unit, which is connectable to the radio frequency, interface
4 where the associated logic unit is operable in a transponder operation mode, in which the reader
5 device acts as radio frequency identification transponder.

1 40. The Reader device according to Claim 20 which comprises a reader logic unit,
2 which is connected to said radio frequency interface and which allows for operating said reader
3 operation mode.

1 41. The Reader device according to Claim 40, wherein said transponder operation
2 mode is operable independently from any power supply.

1 42. The Reader device according to Claim 20 or Claim 21 wherein said reader device
2 is adapted to operate as a passive radio frequency identification transponder in said transponder
3 operation mode.

1 43. The Reader device according to Claim 40, wherein said reader device acts as a
2 passive read-only radio frequency identification transponder in said transponder operation mode.

1 44. The Reader device according to Claim 40, wherein said transponder logic unit
2 comprises a transponder memory.

1 45. The Reader device according to Claim 44 wherein said transponder memory is
2 non-volatile.

1 46. The Reader device according to Claim 45 wherein said transponder memory is
2 configurable.

1 47. The Reader device according to Claim 40, wherein said transponder logic unit is
2 coupled through a switch unit to said radio frequency interface, wherein said switch unit is
3 operable to select between said reader operation mode and said transponder operation mode.

1 48. The Reader device according to Claim 40 wherein said reader device operates
2 autonomously in said transponder operation mode during periods of time, within which said
3 reader device is not energized.

1 49. The Reader device according to Claim 40, wherein said radio frequency interface
2 is adapted to provide signals required for operation of said reader device in said reader operation
3 mode and said transponder operation mode.

1 50. The Reader device according to Claim 40, wherein said reader device supports
2 near field communication (ECMA-340) standard, wherein said reader device is operable with a
3 passive communication mode in said reader operation mode, wherein said reader device is
4 operable with a show communication mode in said transponder operation mode.

1 51. The Reader device according to Claim 40 wherein said reader device is operable
2 with an active communication mode in said reader operation mode.

1 52. A portable electronic device, which is, connected to a reader device for radio
2 frequency identification transponders, wherein said reader device comprises:

3 a) a radio frequency interface and an antenna such that said reader device is
4 adapted to communicate at least with said radio frequency identification transponders in a reader
5 operation mode; and

6 b) an associated transponder logic unit which is connectable to said radio frequency
7 interface, wherein said transponder logic unit (is operable in a transponder operation mode, in
8 which said reader device acts as a radio frequency identification transponder.

1 53. The portable terminal according to Claim 52, wherein said reader device is a
2 reader device according to Claim 39.

1 54. The portable terminal according to Claim 52, wherein said portable electronic
2 device is enabled to communicate via a public land mobile network.

1 55. A system including a portable electronic device and a reader device for radio
2 frequency identification transponders, which is connected to said portable electronic device,
3 wherein said reader device comprises:

4 a) a radio frequency interface and an antenna such that said reader device is
5 adapted to communicate at least with said radio frequency identification transponders in a reader
6 operation mode; and

7 b) a transponder logic unit, which is connected /to, said radio frequency interface,
8 wherein said transponder logic unit is operable in a transponder operation mode, in which said
9 reader device acts as a radio frequency identification transponder.